HALISAURUS AND *PROGNATHODON*, TWO UNCOMMON MOSASAURS FROM THE UPPER CRETACEOUS OF NEW JERSEY

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Abstract

The type specimen of ***Halisaurus platyspondylus*** Marsh, 1869, the type species of its genus, is illustrated for the first time. Vertebrae, teeth, and skull elements of ***Ancylocentrum hungerfordi*** Chaffee, 1939, a junior synonym of ***Prognathodon rapax*** (Hay, 1902), are also figured for the first time. Both specimens come from the New Egypt Formation (late Maastrichtian) of New Jersey. ***Halisaurus***, a member of the subfamily Mosasaurinae, is a rare element in the Upper Cretaceous near-shore fauna of the Atlantic Coastal Plain. It occurs also in the Maastrichtian (Severn Formation) of Maryland and the Campanian of Alabama (Mooreville Member, Selma Chalk) and Kansas (Niobrara Chalk). ***Prognathodon*** belongs to the subfamily Plioplatecarpinae. One of the less common mosasaurs in New Jersey, it occurs also in the Maastrichtian of Maryland (Severn Formation) and Belgium (*craie phosphatée*), as well as in the Campanian of Alabama (Mooreville Chalk), Kansas (lower Pierre Shale), and South Dakota (upper Pierre Shale).

Introduction

Although the Cretaceous marine lizards of North America have been treated in numerous publications over the last century, and have been comprehensively reviewed in an excellent monograph by Dale A. Russell (1967), the amateur or professional paleontologist who is trying to identify a typical find of isolated bones faces no easy task. Associated or even partial skeletons, such as are found in the marine sediments of the Gulf Coast and the Western Interior, are extremely rare in the belt of Upper Cretaceous deposits that parallels the Atlantic coast from New Jersey to South Carolina. Isolated bones, often fragmentary, are what we usually get to work with, and identifications have to be made by comparison with a large and scattered literature. And although Russell has performed a much-needed job of taxonomic consolidation on the East Coast forms, there remain six genera and eight species to which any newly-discovered mosasaur bone might belong.

Particularly frustrating is the fact that some taxa have never been adequately illustrated. As a contribution toward alleviating this situation, the photographs in this

The Mosasaur, 3:37–45
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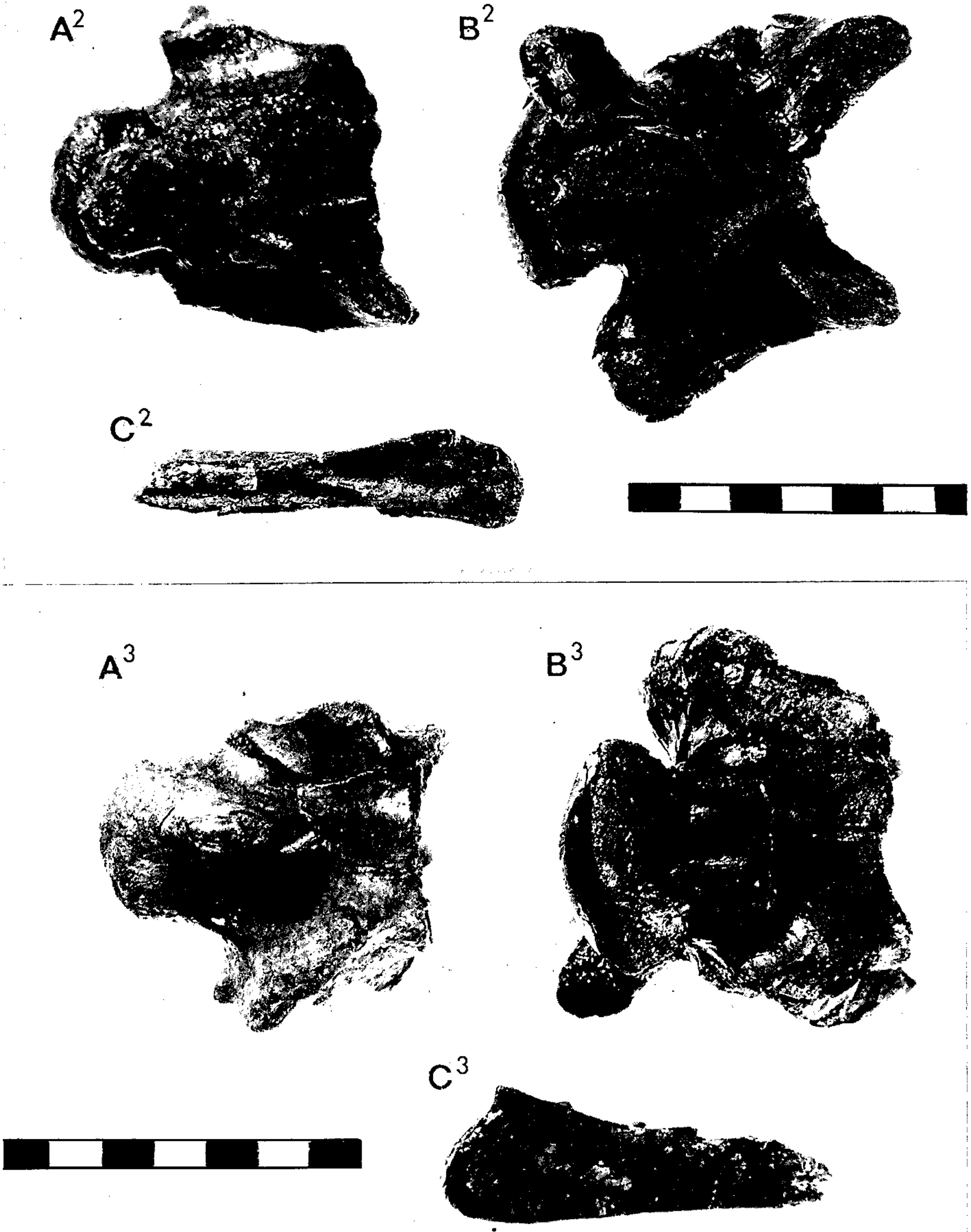

Figure 1, Part 2. *Halisaurus platyspondylus*, TYPE, YPM 444.

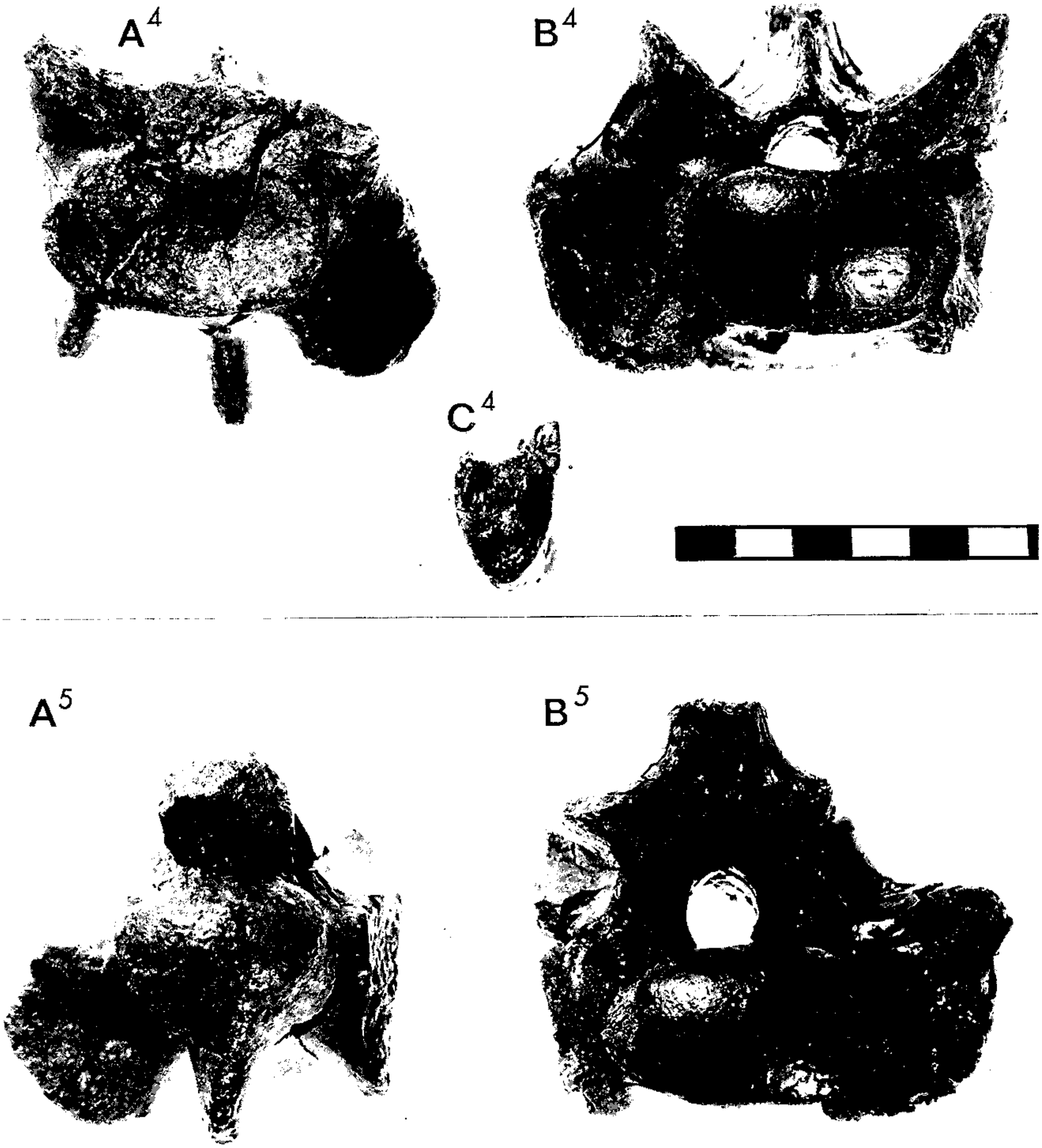

Figure 1, Part 3. *Halisaurus platyspondylus*, TYPE, YPM 444.

Measurements of the anterior thoracic vertebra, in millimeters, are as follows. Those marked with an asterisk (*) are exaggerated by pyritic expansion.

Maximum length of centrum	69.3
Anterior cotyle width	44+
Anterior cotyle height	28+
Posterior condyle width	41.5*
Posterior condyle height	26.3*
Width across posterior zygapophyses	62

Horizon and Locality. Upper New Egypt Formation ("lower Cretaceous Marl bed"), late Maastrichtian, Upper Cretaceous. Cream Ridge Marl Company pit-mine near Hornerstown, Upper Freehold Township, Monmouth County, New Jersey. Collected by John G. Meirs, 1869. (See Baird, 1984, p. 129.)

Discussion. In his 1869 paper on *Halisaurus platyspondylus* and other New Jersey mosasaurs, Marsh promised that the material "will be described in full, with illustrations, at an early day." That day never came, however, and no subsequent author—not even Russell in his monographic revision—has seen fit to illustrate the type specimen of this rare and distinctive mosasaur. The photographs in Figure 1 are intended to remedy this longstanding neglect.

In his 1967 monograph Russell assigned *Halisaurus* questionably to the subfamily Plioplatecarpinae. However, subsequent discoveries of *Halisaurus* material, *e.g.* in the New Egypt ("Navesink") greensand of New Jersey (Baird & Case, 1966) and the Mooreville member of the Selma Chalk of Alabama (Russell, 1970), have enabled Dr. Russell to determine that "*Clidastes*" *sternbergi* Wiman (1920) from the Niobrara Chalk of Kanasas is a species of *Halisaurus*. As Wiman's species was based on a complete and articulated skeleton, the entire morphology of the genus is now available for study, and it has been reclassified as a member of the subfamily Mosasaurinae. The geographic and stratigraphic distribution of the genus are reviewed in Baird (1986, this issue).

Subfamily PLIOPLATECARPINAE

Genus *PROGNATHODON* Dollo, 1889

Prognathodon rapax (Hay, 1902)

(Fig. 2)

Macrosaurus laevis in part, Leidy, 1865, p. 75.
Mosasaurus dekayi, Cope, 1869-1870, pp. 186, 192, fig. 47.
Liodon validus, Cope, 1869-1870, pp. 201, 207, fig. 48(5).
Tylosaurus rapax Hay, 1902, p. 473
Ancylocentrum hungerfordi Chaffee, 1939, pp. 1-5, fig. 1 (1, 3, 6), fig. 2.

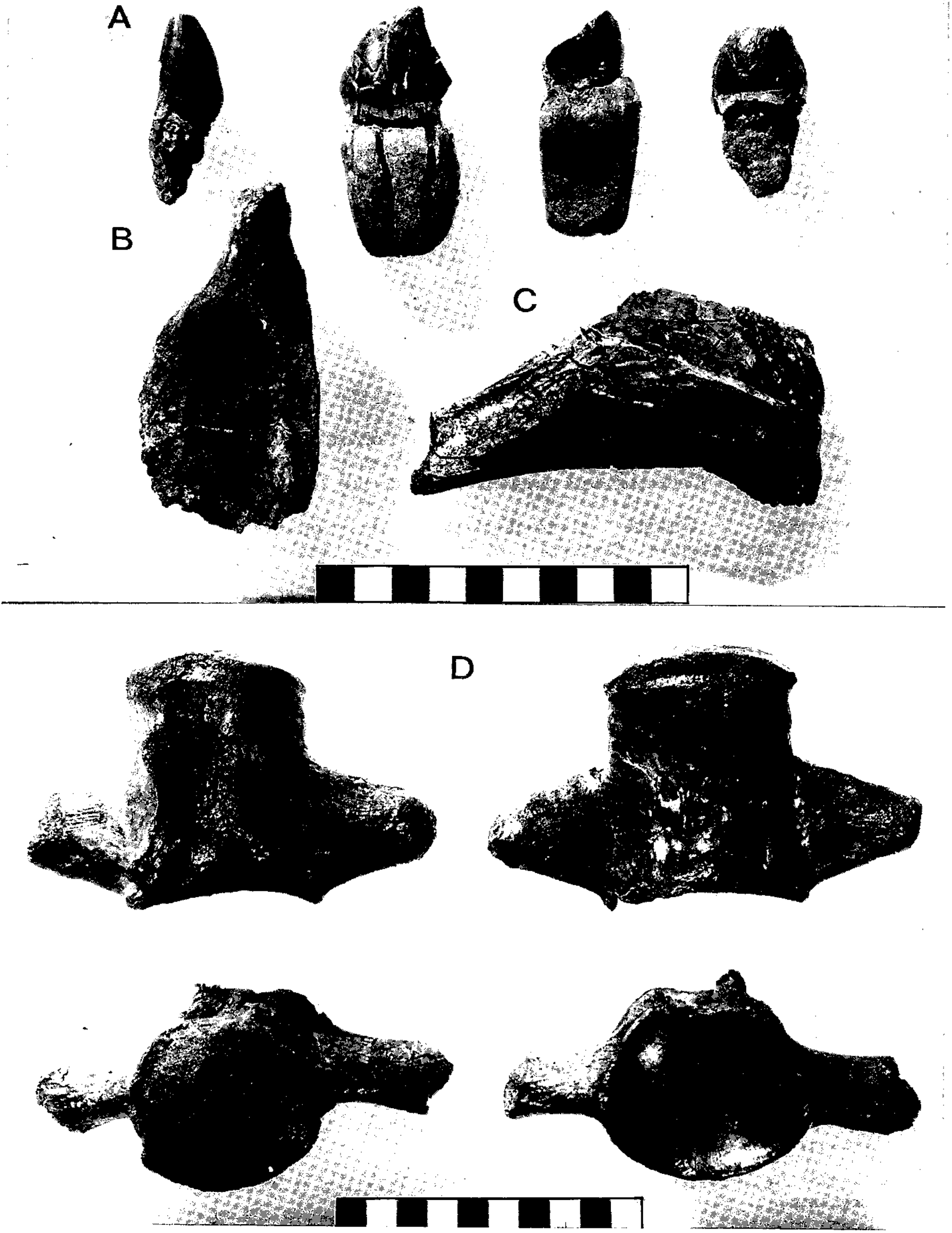

Figure 2. *Prognathodon rapax*, TYPE of *Ancylocentrum hungerfordi*, NJGS 9827. *A*, teeth; *B*, left prefrontal in dorsal view; *C*, left squamosal in lateral view; *D*, lumbodorsal vertebrae in dorsal, ventral, posterior, and anterior views. Scales in centimeters.

Diagnosis. Distinguished from other species of *Prognathodon* by large tuberosity on anteriomedian edge of quadrate shaft, and suprastapedial process strongly constricted dorsally (Russell, 1967, p. 165).

Material. NJGS 9827, TYPE of *Ancylocentrum hungerfordi*: two quadrates, left squamosal, left and right prefrontals; left articular, splenial and angular; right angular; 5 teeth; 5 lumbodorsal vertebrae; all damaged or fragmentary. The cervical vertebra included by Chaffee belongs instead to the crocodilian *Thoracosaurus neocesariensis*.

In the years since its description by Chaffee the specimen has gradually deteriorated as the result of pyrite disease. The vertebral centra, which had apparently been shellacked, are least affected, but the teeth and dermal bones have exploded almost like popcorn. Fortunately several of the major elements, including the diagnostic quadrates, had been photographed by Chaffee before deterioration set in. In an effort to salvage and stabilize the specimen I have soaked the bones with several applications of dilute shellac to hold them together and seal off their interiors, then consolidated them with acetone-based cellulose cement after reassembling the fragments as far as possible.

Horizon and Locality. Upper New Egypt Formation, late Maastrichtian, Upper Cretaceous. Invesand Company marl pit near Sewell, Mantua Township, Gloucester County, New Jersey. Collected and donated by Churchill Hungerford, Jr.

Discussion. Chaffee photo-illustrated the quadrate, articular, splenial ("presplenial"), and angular ("splenial") of NJGS 9827, and gave measurements of one lumbodorsal ("1st caudal") vertebra. However, he provided no figures of the vertebrae and teeth, and failed even to identify the prefrontals and squamosal. Russell supplied only a drawing of the same quadrate and a citation of two nearly unintelligible drawings of another quadrate that Cope (who was a worse-than-mediocre draftsman) had published in 1870; he failed to note a good two-view drawing of the splenial that Cope had published under the name *Mosasaurus dekayi*. With no more pictorial documentation than this, *Prognathodon rapax* was unlikely to be recognized by collectors and museum curators. Figure 2 should help with the particular problem of identifying the elements that are most frequently found: isolated vertebrae and teeth.

For a survey of the stratigraphic and geographic distribution of *Prognathodon*, with a new occurrence record for *P. rapax* in the Severn Formation of Maryland, see Baird (1986, this issue).

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